

Methodological Features of the Organization of Independent Work of Students in the Process of Teaching Mathematics

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Abstract: The article deals with the features of the organization of independent work of students in mathematics, depending on the direction of specialization. The main types of independent work of students, the stages of its organization are indicated, examples of independent work of students of humanitarian and technical directions are given.

Keywords: independent work, teaching mathematics, technical university, applied orientation, teaching methods.

In the State Educational Standards of Higher Education, a fairly large number of hours are allocated to students' independent work. Basically, we are talking about the traditional types of independent work, provided for the independent work of students in the discipline as an evaluative tool of students' knowledge.

However, as practice and numerous studies of methodologists-psychologists show, the organization of independent work of students, as well as the organization of classroom work of students, requires a thorough methodological approach that takes into account the main goals of training, as well as the individual characteristics of students in different areas of specialization. In particular, it is necessary to share approaches to organizing students' independent work for students of technical and humanitarian fields.

As you know, students' independent work is realized:

A. within the framework of classroom studies with students (at lectures, practical classes, seminars, in the process of performing laboratory,

research, experimental work, writing control and independent work);

B. outside the classroom - during consultations, when performing individual tasks of a creative nature, preparing projects and research on the instructions of a teacher, etc.;

C. outside the university when preparing students for practical and seminars, writing term papers, completing assignments for independent work of students, conducting scientific research, preparing presentations, etc.

Proper motivation of students plays an important role in organizing students' independent work. One of the main motivating factors is preparation for further effective professional activity. The student passes from a passive consumer of knowledge to an active stage. He becomes an active participant in the educational process, he himself participates in the process of searching and acquiring knowledge, which, in turn, makes the process of assimilating knowledge more effective.

Organization of students' independent work can include the following stages [2]:

1. Determination of the goals of independent work in accordance with the general goals determined by the State educational standard, taking into account the specifics of the future professional activity of students.
2. Selection of the content of independent work of students in accordance with the requirements of the discipline, as well as taking into account the specifics of a particular training profile and individual psychological characteristics of students.

3. The choice of teaching methods aimed at organizing students' independent work, in accordance with the learning objectives and psychological characteristics of representatives of various profiles.
4. Creation of a system of tasks for independent work of students, corresponding to the goals of learning and reflecting the content of each topic and section of the discipline being studied.
5. Organization of control, which, in turn, includes the selection of appropriate means and forms of control, the definition of requirements for the performance of tasks and the designation of criteria for assessing the results of independent work of students.

Independent work of students can be reproductive or creative [1]. In our opinion, the following can be classified as independent reproductive work:

1. solving educational problems in practical classes, including in the process of performing various control and verification works;
2. fulfillment of tasks of independent work of students and term papers;
3. work with educational and methodological literature for the purpose of independent acquaintance with one or another section of mathematics;
4. work with reference books (reference books, tables, standards and other sources of information) in order to find the necessary data to solve the set mathematical problems, including applied problems;
5. reading and analysis of drawings, tables, diagrams, graphs of various dependencies.

The mathematics teacher will use both traditional methods and modern teaching methods to meet the requirements of the school syllabus and to facilitate the development of logical reasoning. The success of a mathematics lesson depends on how the teacher manages to choose the most suitable methods, and didactic instruments, to combine them and to

organize them in a harmonious assembly to achieve the proposed objectives. [3]

The following can be classified as creative independent works:

1. systematization of the studied and studied material;
2. project activities;
3. conducting independent scientific research;
4. setting and solving problems of an applied nature based on material from the field of future professional interests of students. Based on all of the above, we will designate the methodological features of the organization of independent work of students at the present stage of education, taking into account the requirements.

1. Depending on the differences in the needs in mathematics for different areas of training students, the approaches to organizing students' independent work should be different. So, for example, for students of technical directions, special attention should be paid to demonstrating the applied capabilities of mathematics in solving technical problems both within the framework of practical classes and lectures, illustrating theoretical material with similar examples, and in the process of organizing students' independent work, offering them tasks for independent search and construction of a mathematical model of real situations, when considering the features of a particular technical design or mechanism.

The most effective form is when the student's perception is guided by the teacher. He directs his attention through a system of leading questions that help to understand the drawing and comprehend its essence. Guidance from the teacher should take various forms depending on the novelty and complexity of the drawing perceived by the student. [4]

The mechanical meaning of the derivative for students of the direction "Automobile transport" can be illustrated by the problem of finding the speed and acceleration of the piston in the cylinders of

internal combustion engines. After that, they can be offered a similar task for finding the speed and acceleration of other mechanisms found in cars, in particular, we can talk about finding the path, speed and acceleration of the pusher for various cam mechanisms. Such a task can develop into a serious study, the results of which can later be used when writing a term (diploma) work in a specialized discipline.

Students of humanitarian profiles (linguists, historians, lawyers, art historians, etc.), according to psychological and pedagogical studies of a number of methodologists, are more focused on performing tasks of a creative nature. As you know, the specificity of humanitarian thinking lies in the predominance of the associative over the formal-logical, strong emotional coloring, the priority of the concrete over the abstract, etc. For humanities, as well as for representatives of technical profiles, it is important to see the practical significance of the mathematical knowledge and skills they have acquired. However, for representatives of these areas, it is more typical to perform research assignments, write abstracts and essays, conduct independent research on a particular problem of an interdisciplinary nature (for example, mathematical analysis of texts for literary scholars, statistical research of various individual characteristics of a person for future psychologists and sociologists, study of statistical patterns of crime for future lawyers, etc.)

2. Creation of a system of multilevel tasks, taking into account the peculiarities of the mathematical training of representatives of different profiles. Moreover, it should be noted that the system of multilevel tasks will also have its own specifics for each of the areas of specialization of students and will be of a different nature.

3. It is necessary to clearly define the criteria for monitoring the results of independent work of students, taking into account the individual characteristics of students in different profile areas.

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